

## Motorcycle Helmet Use Study

TO THE EDITOR: In "Helmet Use Improves Outcomes After Motorcycle Accidents" in the October 1991 issue, Murdock and Waxman reported findings leading them to conclude that helmet use was effective in preventing death and disability from head injury in patients brought to a trauma center.<sup>1</sup> The authors, however, went on to state that "these data support the need for both increased public education regarding helmet use and mandatory use legislation" (p 372). It should be pointed out that although the *authors* may support such measures, the *data* did nothing of the sort. This was a study of the relationship between helmet use and trauma center outcomes. This was *not* a study of proposed interventions such as increased public education or mandatory helmet use and therefore permits no conclusions, positive or negative, to be drawn regarding such interventions. A study showing that alcohol avoidance improves hospital outcomes would not, for example, show *per se* that increased public education regarding alcohol use would be cost effective, or that the mandatory prohibition of alcohol would be wise public policy. As an emergency physician and motorcyclist, I believe in the value of the helmet—but I also believe that the cause of good preventive medicine will not in the end be well served by bad science.

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### REFERENCE

1. Murdock MA, Waxman K: Helmet use improves outcomes after motorcycle accidents. *West J Med* 1991 Oct; 155:370-372

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TO THE EDITOR: Although most public health professionals (including ourselves) welcome data demonstrating that "helmet use was effective in preventing death and disability," the study by Murdock and Waxman in the October 1991 issue<sup>1</sup> does not do this. The flaw lies in nonrandomization: helmet-wearing motorcyclists are different from non-helmet-wearing motorcyclists. This is suggested both by intuition—those who wear helmets are probably more concerned about safety—and by Murdock and Waxman's findings: those who wore helmets were significantly less likely to be intoxicated (suggesting both better judgment about safe riding conditions and better response times), more likely to be able to pay hospital bills and to be insured (and therefore more likely to have been employed persons who were better able to maintain their motorcycles), and were slightly older (possibly suggesting more maturity). It is therefore possible that the helmeted riders may have had less serious accidents—that is, accidents occurring at lower speeds and impacts. It would also be interesting to ascertain—by examining helmets and by evaluating skull and other fracture sites—if those wearing helmets may have had fewer head injuries because they had different types of accidents and were less likely to have sustained direct head trauma, an alternative hypothesis that is suggested by the five helmeted riders who died of thoracic and abdominal injuries.

In addition to the fundamental problem of nonrandomization, the lack of denominator data is also of concern, as the authors point out (perhaps, for example, nonhelmeted riders had a greater number of minor injuries, and these riders were more likely to be taken to one of the other trauma centers in the county).

We are not espousing a randomized trial, and we are impressed by the data that are presented here. We are, how-

ever, suggesting that more modest conclusions and claims for subsequent action may be appropriate.

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### REFERENCE

1. Murdock MA, Waxman K: Helmet use improves outcomes after motorcycle accidents. *West J Med* 1991 Oct; 155:370-372

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## Dr Waxman and Ms Murdock Respond

TO THE EDITOR: We appreciate the comments in the two letters regarding our review of outcomes in helmet-wearing and non-helmet-wearing motorcycle accident victims brought to our trauma center. While we agree that views expressed by the authors of these letters have some validity, we nonetheless stand by the conclusions we made.

Drs Frank and White correctly point out that our study was not randomized, and thus there may have been other differences between the two groups of patients besides helmet use. Hence, theoretically, helmet use may have been coincidental to outcome, while other differences between the groups were really responsible for the different outcomes. Although this is a logical possibility, it seems unlikely that any of these other variables would explain the difference in facial and head injuries that we observed in patients brought to our trauma center. Better employment, better motorcycles, or better judgment may explain why accidents might not occur and may even contribute to less severe accidents. But once a serious motorcycle accident with injury has occurred, it is difficult to imagine how these factors would protect the head and face. Rather, the use of a helmet clearly seems most relevant in this regard.

Dr Goldstein correctly points out that our study was not designed to test the effectiveness of public education or mandatory helmet use, but he implies it was "bad science" for us to suggest public education or mandatory helmet use. We strongly disagree with this implication. Dr Goldstein apparently accepts our conclusion that helmet use prevented serious injuries but challenges our suggestion that telling people about this may be of benefit. The benefits of public education are well known, and it seems irrational to suppose that education regarding helmet use would be an exception.

We base our support for mandatory helmet use legislation not only on our data but also on numerous studies demonstrating an increasing number of head injuries following the repeal of mandatory helmet-use legislation in a number of states, as referenced in our article. While helmet-use legislation is a complex political issue and Dr Goldstein is certainly entitled to his opinions, we object to his labeling our work as "bad science." The critiques he expressed appear to be based more on political bias than on scientific disagreement.

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